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Ho-Suk Kim

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/542,642
Filing Date: July 19, 2005
Appellant(s): KIM ET AL.

Selah Park
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 16, 2010 appealing from the Office action mailed March 15, 2010.

(1) *Real party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

Examiner is not aware of any related proceedings.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

The Appellants' statement of the status of amendments after final rejection contained in the brief is correct.

(5) *Summary of Claimed Subject Matter*

The summary of claimed subject matter contained in the brief is correct.

(6) *Grounds of Rejection to be Reviewed on Appeal*

The Appellant's statement of the grounds of rejection in the brief is correct.

(7) *Claims Appendix*

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

<u>Number</u>	<u>Name</u>	<u>Date</u>
US 6,338,492	Schilling et al.	January 15, 2002
US 6,337,120	Sasaki et al.	January 8, 2002
US 2002/0106954	Sakumoto, Naruo	August 8, 2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 1, 3-6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling et al. (U.S. Pat. No. 6,338,492) (hereinafter "Schilling").

Regarding claim 1, Schilling teaches a sealing structure for polymer electrolyte fuel cell having a membrane electrode assembly (4) comprising: a bipolar plate (2) with groove bottom (sealing groove 17) and blind holes (anchor grooves 16, 18) that is coupled to the periphery of the groove bottom (sealing groove 17) and surrounds the reaction site of the bipolar plate (2) (see figs.1 and 3B). As shown in Fig. 3B, Shilling teaches that the blind holes (anchor grooves 16, 18) extend towards the outer edge of the bipolar plate (2). Schilling further teaches that the sealing element (member 10) and that it is known in the art to use rubber as a sealing material and also teaches that the sealing element (member 10) is made of an elastomeric material (see col. 1, lines 24-26; col. 3, lines 56-58). Schilling teaches a plug (gasket 15) interposed between said

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bipolar plate (2) and a membrane electrode assembly (MEA 4; see figures 1 and 3B). Schilling teaches the bipolar plate has an injected seal that has plugs (gaskets 15) that are formed as a plate (see col. 3, lines 19-21 and col. 4, lines 3-22; fig. 3A). Schilling further teaches that the sealing element (member 10) is formed during an injection process (see col. 4, lines 3-22). Claim 1 is considered product-by-process claim. The cited prior art teaches all of the positively recited structure of the claimed apparatus or product. The determination of patentability is based upon the apparatus structure itself. The patentability of a product or apparatus does not depend on its method of production or formation. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (see MPEP § 2113).

Schilling does not specifically teach that the anchor width is greater than the sealing groove.

Consequently, as evidenced by Schilling, the width of the anchor is a recognized known result effective variable whose determination would accordingly have been within the ambit of a person of ordinary skill in the art without undue experimentation. "The discovery of an optimum value of a known result effective variable, without producing any new or unexpected results, is within the ambit of a person of ordinary skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980) (see MPEP § 2144.05). Schilling discloses that the sealing element (member 10) is inserted into the blind holes (anchor grooves 16, 18) by way of plugs (gasket 15). Schilling further discloses that this

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process is formed by an injection method and is extended over the entire extent of the groove bottom (sealing groove 17) to strengthen the anchorage to the bipolar plate (2) (see col. 4, lines 3-22). It is known that the width of the anchor can be changed to be greater than the width of the sealing groove for the known result effect variable.

Therefore, it would have been obvious to a person of ordinary skill in the art to make this modification to optimize the width of the anchor to get the proper sealing for the polymer electrolyte fuel cell.

Regarding claim 3, Schilling does not specifically teach that the said anchor groove has a width of 1.5 times the width of the sealing groove. However, it would be known by one with ordinary skill in the art to change the size or proportion of the embodiments to properly seal the structure (col. 4, lines 23-35). In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device (MPEP § 2144.04). It is the position of the examiner that the disclosure provides no evidence of the criticality with regard to the width of the anchor groove in comparison to the sealing groove.

Therefore, it would have been obvious to one with ordinary skill in the art to change the size or proportion to properly seal the structure of the polymer electrolyte fuel cell.

Regarding claim 4, Schilling does not specifically teach a sealing structure for a polymer electrolyte fuel cell, wherein said groove bottom (sealing groove 17) and an blind holes (anchor grooves 16, 18) are equal in depth (see fig. 3B).

Consequently, as evidenced by Schilling, the depth of the disclosed sealing groove and anchor is a recognized known result effective variable whose determination would accordingly have been within the ambit of a person of ordinary skill in the art without undue experimentation. The discovery of an optimum value of a known result effective variable, without producing any new or unexpected results, is within the ambit of a person of ordinary skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980) (see MPEP § 2144.05). Schilling discloses that the sealing element (member 10) is inserted into the blind holes (anchor grooves 16, 18) by way of plugs (gasket 15). Schilling further discloses that this process is formed by an injection method and is extended over the entire extent of the groove bottom (sealing groove 17) to strengthen the anchorage to the bipolar plate (2) (see col. 4, lines 3-22). It is known that the depth of the anchor can be changed to be equal to the depth of the sealing groove for the known result effect variable. It is the position of the examiner that the disclosure provides no evidence of the criticality with regard to the depth of the sealing groove and anchor groove being equal to one another.

Therefore, it would have been obvious to one with ordinary skill in the art to modify the sealing groove and anchor for a polymer electrolyte fuel cell to have the same depth.

Regarding claim 5, as shown in figure 3B, Schilling teaches a sealing structure for polymer electrolyte fuel cell (sealing system; fig. 3B), wherein said blind holes (anchor grooves 16, 18) is formed extending into the periphery of the groove bottom (sealing groove 17) along a direction perpendicular to the periphery of the groove bottom (sealing groove 17) (see col. 4, lines 3-22).

Regarding claim 6, Schilling teaches an opposed bipolar plate (3) that has a membrane electrode assembly (4) located between the other bipolar plate (2) (see fig. 1) (see col. 3, lines 39-60). It is inherent that the bipolar plate (3) would have the same characteristics as bipolar plate (2).

Regarding claim 9, Schilling also teaches a polymer electrolyte fuel cell comprising said sealing structure (col. 3, lines 39-60).

Regarding claim 10, Schilling teaches that the anchor groove (12) of the opposed bipolar plate (3) is symmetric to the anchor groove (9) of the bipolar plate (2) (see fig. 1).

2. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling as applied to claim 1, 3-6 and 9 above, and further in view of Sasaki et al. (U.S. Pat. No. 6,337,120) (hereinafter "Sasaki").

Regarding claim 7, Schilling does not specifically teach that the type of rubber used for the sealing structure be made of silicon, fluorine, or olefin.

However, Sasaki teaches a rubber silicon material for the sealing structure for the polymer electrolyte fuel cell (see col. 4, line 48).

The Courts have held that the selection of a known material, which is based upon its suitability for the intended use, is within the ambit of one of ordinary skill in the art.

See *In re Leshin*, 125 USPQ 416 (CCPA 1960) (see MPEP § 2144.07).

Therefore, it would be obvious to a person with ordinary skill in the art to recognize the use of a silicon rubber material for the sealing structure because of its low viscosity which makes it easy to inject into the mold (col.4, lines 51-52).

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling applied to claim 1, 3, 4-6 and 9 above, and further in view of Sakumato et al. (U.S. Pat. Pub. No. 2002/0106954 (hereinafter "Sakumato")).

Regarding claim 8, Schilling teaches a graphite bipolar plate (col. 2, lines 23-24) and a plug (gasket 15) that forms a plate (see fig. 3A), but does not specifically teach the type of elastic material used for the gasket.

However, Sakumoto teaches a carbon gasket (or flange) (see par. 0005 and 0006).

The Courts have held that the selection of a known material, which is based upon its suitability for the intended use, is within the ambit of one of ordinary skill in the art.

See *In re Leshin*, 125 USPQ 416 (CCPA 1960) (see MPEP § 2144.07).

Furthermore, the combination of familiar elements is likely to be obvious when it does no more than yield predictable results. See *KSR Int'l v. Teleflex Inc.*, 127 Sup. Ct. 1727, 1742, 82 USPQ2d 1385, 1397 (2007) (see MPEP § 2143).

Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the use of a carbon bipolar plate and gasket in the bipolar plate of Schilling, because Sakumoto teaches it can fabricate the sealing structure for the polymer electrolyte fuel cell.

(10) Response to Argument

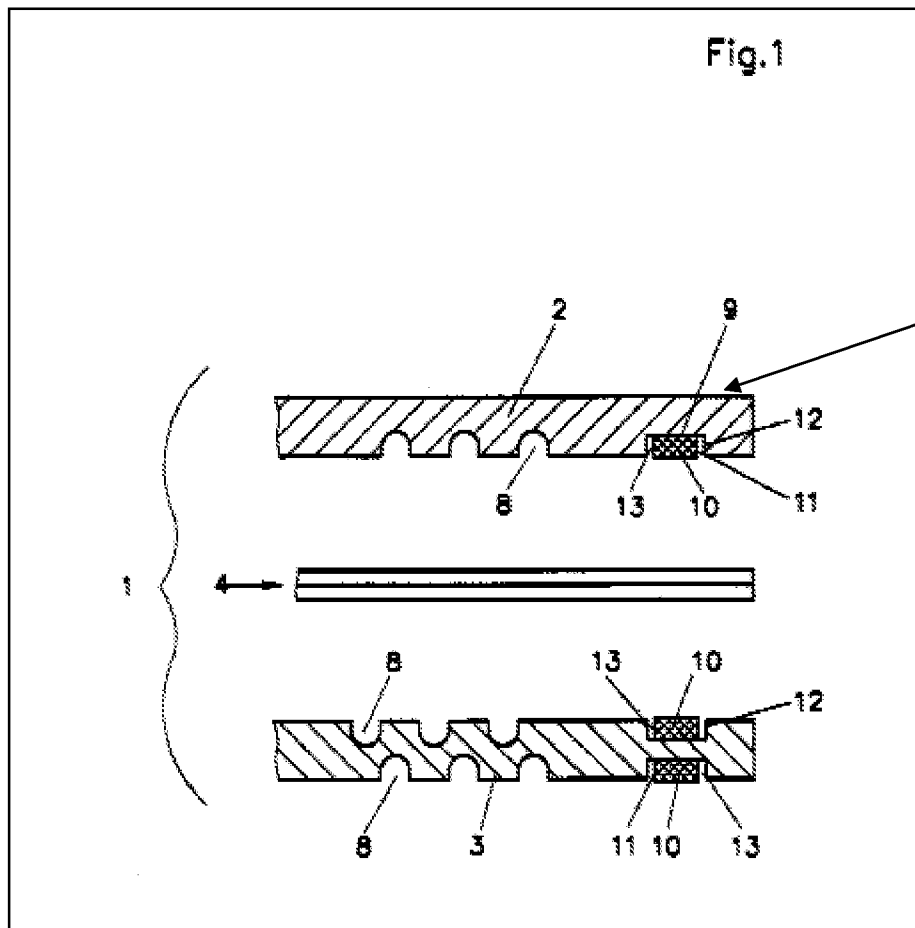
1. That Schilling does not teach does not teach the claimed gasket plate which is placed between the bipolar plate and the membrane electrode assembly (MEA).

Schilling shows plugs (gasket plate 15) in Fig 3B. It can be evidenced by Fig. 3B that the plugs are in a plate-like shape. Schilling shows in Fig. 1, a bipolar plate (2) on one side of the sealing element (10) and the MEA (membrane electrode assembly 4) on the opposing side of the sealing element (10). In Fig. 3B of Schilling it can be seen that the plug (gasket plate 15) is part of the sealing element (10). It is inherent that since the plug (gasket plate 15) is part of the sealing element (10), that it is interposed between the bipolar plate (2) and the membrane electrode assembly (MEA 4). The claim language does not recite that the gasket plate interposed between the bipolar plate and the membrane electrode assembly must run the entire length of the membrane electrode assembly and the bipolar plate. Therefore, the plugs (gasket plate 15) are interposed between the membrane electrode (MEA 4) and the bipolar plate (2).

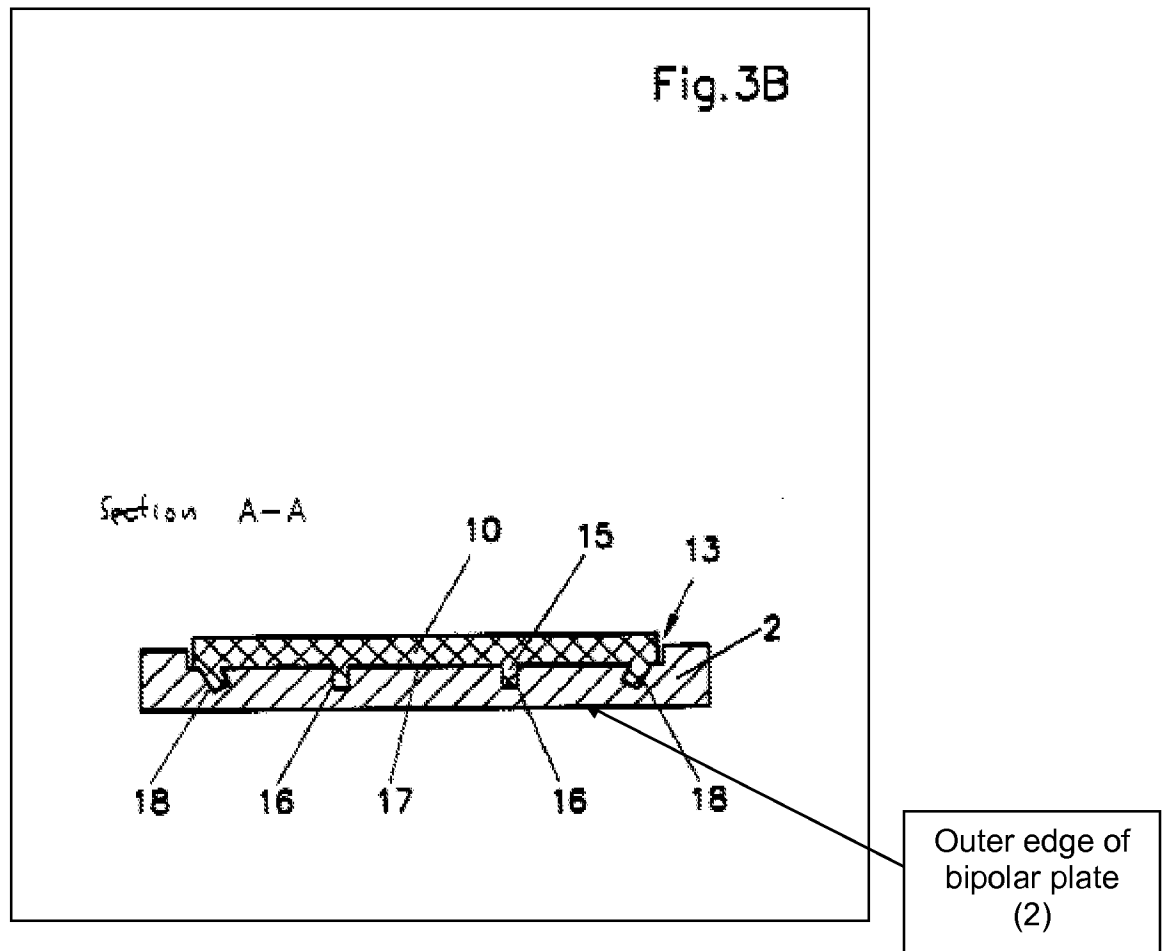
2. That Schilling does not teach the anchor groove extending toward an outer edge of the bipolar plate.

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As shown in Figure 3B, Schilling does teach blind holes (anchor grooves 16, 18) that are extended down into the outer edge of the bipolar plate (2). Schilling shows in Fig. 1 that the sealing element (10) that incorporates the blind holes (anchor grooves 16, 18) would be formed extending towards the outer edge of the bipolar plate (2). It is the position of the Examiner that the outer edge of the bipolar plate (2) can be the bottom of the bipolar plate (2) of Schilling (please refer to the Figs. below). The Applicant argues that the blind holes (anchor grooves 16, 18) are extending **to** the outer edge of the plate bipolar plate. However, this is not commensurate with the claim that only recites **toward** the outer edge. Therefore, Schilling reads on the claim.



Outer edge of
bipolar plate
(2)



(11) Evidence Appendix

None.

(12) Related Proceedings Appendix

None.

For the above reasons, it is believed that all the rejections should be sustained.

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Respectfully Submitted,

/PATRICIA DAVIS/
Examiner, Art Unit 1795

Conferees,

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795

/Patrick Joseph Ryan/
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